

App. No. 10/516,638
Office Action Dated December 5, 2005

REMARKS

Reconsideration is respectfully requested in view of the above amendments and following remarks. Claims 1-7 have been amended editorially. No new matter has been added. Claims 1-7 are pending.

Claim rejections - 35 U.S.C. § 112

Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to claim the subject matter of the present invention. Claims 1-7 have been amended editorially, taking the issues noted in the rejection into account. Applicants respectfully submit that claims 1-7 are definite.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

Claim rejections - 35 U.S.C. § 103

Claims 1, 2, 4 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirota et al. (Bulletin of the Chemical Society of Japan, Differences in the Catalytic Activity of Nickel, Platinum and Palladium as Observed in the Isotopic Exchange Reaction of Paraxylene with Deuterium Oxide, 1962, 35, pages 228-332), in view of Rylander (Hydrogenation Methods, 985, Academic Press, Inc., Orlando, Florida, page 4). Applicants respectfully traverse the rejection.

Claim 1 requires a process of replacing with deuterium a hydrogen atom of a methyl group or a hydrogen atom bonded to a carbon atom at a benzyl position and the other carbon of an alkylene group having not less than C2, in a compound containing the

App. No. 10/516,638
Office Action Dated December 5, 2005

methyl group or the alkylenc group having not less than C2, directly bonded to an aromatic ring which may have a substituent (see for example page 2, lines 18-24). Significantly, claim 1 also requires the presence of activated palladium carbon for deuteration of the compound in a deuterated solvent (see for example page 2, lines 24-26). The palladium carbon may be activated by using, for example, hydrogen gas (see for example page 7, lines 32-35cx). By using the activated palladium carbon as a catalyst, the methyl group can be deuterated very effectively, and further, hydrogen atoms other than on a benzyl position can be replaced with deuterium (see page 2, lines 6-17).

Hirota fails to suggest using activated palladium carbon as the catalyst. In fact, Hirota discloses using palladium black, an unsupported catalyst, for deuteration of p-xylene. As such, only 30% of the hydrogen atoms of the methyl group of p-xylene can be exchanged with deuterium atoms (see page 231, Table IV). On the other hand, when activated palladium carbon is used as the catalyst for deuteration of xylene in accordance with the present invention, 64% of the hydrogen atoms of the methyl group of xylene can be exchanged with deuterium atoms (see Example 2 in Table 2 and Example 25 in Table 8). Nothing in Hirota or any of the other references suggests that improved deuteration of the methyl group could be achieved by using activated palladium carbon as the catalyst.

Rylander discloses that noble metals are rarely used in unsupported form, and provides activated carbon as an example of catalyst supports (see page 4, lines 1-2 and line 8). However, Rylander discloses that activated carbons differ greatly in their effectiveness when used as catalyst supports and that it is difficult to delimit the factors present in the carbon that influence performance (see page 4, lines 15-17). Therefore, Rylander fails to suggest any particular form of activated carbon that would be

App. No. 10/516,638
Office Action Dated December 5, 2005

reasonably expected to improve the deuteration of the methyl group and achieve replacement of hydrogen atoms other than on a benzyl position.

Applicants respectfully submit that the combination of Hirota and Rylander cannot suggest a process of replacing with deuterium a hydrogen atom of a methyl group or a hydrogen atom bonded to a carbon atom at a benzyl position and the other carbon of an alkylene group having not less than C2, in a compound containing the methyl group or the alkylene group having not less than C2, directly bonded to an aromatic ring which may have a substituent, which involves placing the compound in a deuterated solvent in the presence of activated palladium carbon, under sealed reflux condition. Hirota discloses a process for deuteration of p-xylene in the presence of an unsupported catalyst, and fails to suggest using activated palladium carbon. Rylander does not cure this deficiency. In fact, by concluding that buying commercial catalysts is advantageous over using laboratory preparations (see page 4, lines 15-23), Rylander represents nothing more than invitation to experiment.

As demonstrated above, Hirota and Rylander fail to teach or suggest the process of the present invention. Further, since it would not have been obvious to combine and further modify Hirota and Rylander, Applicants submit that the references fail to suggest the invention of the present claims.

Claims 2, 4 and 7 depend from claim 1. Claims 2, 4 and 7 are patentable over Hirota and Rylander for at least the same reasons as claim 1.

Favorable reconsideration and withdrawal of the rejection are respectfully requested.

App. No. 10/516,638

Office Action Dated December 5, 2005

In view of the above, favorable reconsideration in the form of a notice of allowance is requested. Any questions or concerns regarding this communication can be directed to the attorney-of-record, Douglas P. Mueller, Reg. No. 30,300, at (612) 455.3804.

Respectfully Submitted,

Dated: Feb. 27, 2006



Douglas P. Mueller

Reg. No.: 30,300

Hamre, Schumann, Mueller & Larson, P.C.

225 South Sixth Street, Suite 2650

Minneapolis, MN 55402

612.455.3800